

What is claimed is:

1. A method of manufacturing optical glass elements by press molding a glass material with a pressing mold comprising an upper mold and a lower mold, at least one of the upper mold and the lower mold being vertically movable,

at least one of the upper mold and the lower mold having a shape such that when the glass material is in contact with the upper mold and the lower mold, a molding surface of at least one of the upper mold or the lower mold forms a closed space with a surface of the glass material,

which method comprising:

supplying a glass material, at a temperature of less than a temperature at which the glass material exhibits a viscosity of 10^{11} poises, between the upper mold and the lower mold

heating the supplied glass material by thermal conduction by means of contact with the upper mold or lower mold on the side on which the space is formed, and,

moving at least one of the upper mold and the lower mold at an average moving rate of less than or equal to 10 mm/min at least for a distance h micrometers after the glass material becomes in contact with the upper mold and the lower mold, when a temperature of the pressing mold is at a predetermined temperature T_2 within a range in which the glass material exhibits a viscosity of from $10^{7.4}$ to $10^{10.5}$ poises,

wherein a maximum height of the space in the direction of the moving of the movable mold is denoted as h micrometers.

2. The method of Claim 1 wherein at least one of the upper mold and the lower mold which forms the closed space has a concave surface with a paraxial radius of curvature r_1 in the molding surface and the surface of the

glass material which forms the closed space with the molding surface has a convex surface with a radius of curvature r_0 , wherein $r_1 < r_0$.

3. The method of Claim 2 wherein a pressure applied to the glass material by moving at least one of the upper mold and the lower mold is increased on or after the time when the moving distance of said mold reaches the distance h micrometers after the glass material becomes in contact with the upper mold and the lower mold.

4. The method of Claim 3 wherein the average increasing rate of the pressure is less than or equal to 0.5kgf/mm^2 per second.

5. The method of Claim 4 wherein the average moving rate of at least one of the upper mold or the lower mold is increased on or after the time when the moving distance of said mold reaches the distance h micrometers after the glass material becomes in contact with the upper mold and the lower mold.

6. A method of manufacturing optical glass elements by press molding a glass material with a pressing mold comprising an upper mold and a lower mold, at least one of the upper mold and the lower mold being vertically movable,
at least one of the upper mold and the lower mold having a shape such that when the glass material is in contact with the upper mold and the lower mold, a molding surface of at least one of the upper mold or the lower mold forms a closed space with a surface of the glass material,
which method comprising:
supplying a glass material between the upper mold and the lower, and
moving at least one of the upper mold and the lower mold at an average moving rate of less than or equal to 10 mm/min at least for a distance h

micrometers after the glass material becomes in contact with the upper mold and the lower mold, when a temperature of outer surface of the supplied glass material is higher than the interior of the glass material and the outer surface is at a predetermined temperature T1 within a range in which the glass material exhibits a viscosity of from $10^{7.4}$ to $10^{10.5}$ poises, and the temperature of the pressing mold is at a predetermined temperature T2 within a range in which the glass material exhibits a viscosity of from $10^{7.4}$ to $10^{10.5}$ poises, wherein a maximum height of the space in the direction of the moving of the movable mold is denoted as h micrometers.

7. The method of Claim 6 further comprising heating the glass material so that the outer surface of the glass material reaches a temperature T1 in which the glass material exhibits a viscosity of from $10^{7.4}$ to $10^{10.5}$ poises prior to supplying the glass material between the upper mold and the lower mold.

8. The method of Claim 7 wherein at least one of the upper mold and the lower mold which forms the closed space has a concave surface with a paraxial radius of curvature r1 in the molding surface and the surface of the glass material which forms the closed space with the molding surface has a convex surface with a radius of curvature r0, wherein $r1 < r0$.

9. The method of Claim 8 wherein a pressure applied to the glass material by moving at least one of the upper mold and the lower mold is increased on or after the time when the moving distance of said mold reaches the distance h micrometers after the glass material becomes in contact with the upper mold and the lower mold.

10. The method of Claim 9 wherein the average increasing rate of the pressure is less than or equal to 0.5kgf/mm^2 per second.

11. The method of Claim 10 wherein the average moving rate of at least one of the upper mold or the lower mold is increased on or after the time when the moving distance of said mold reaches the distance h micrometers after the glass material becomes in contact with the upper mold and the lower mold.

12. An optical pick up unit comprising a semiconductor laser source, a collimator lens, a beam splitter, a $1/4$ wave plate, an iris, an object lens, a detective condensing lens, a photo-detector, and an actuator, wherein the object lens is manufactured by the method of Claim 1.

13. An optical pick up unit comprising a semiconductor laser source, a collimator lens, a beam splitter, a $1/4$ wave plate, an iris, an object lens, a detective condensing lens, a photo-detector, and an actuator, wherein the object lens is manufactured by the method of Claim 2.